REMARKS

Applicants have amended their claims in order to further clarify the definition of various aspects of the present invention. Specifically, claim 1 has been amended to positively recite that the polyamide resin (A) contains phosphorus compound, and to recite that a concentration of the phosphorus compound in the polyamide resin (A), in terms of phosphorus atom, is 200 ppm or less. In light of this antecedent basis for the phosphorus compound, claim 1 has been further amended, in connection with formula (1), to recite "the" phosphorus compound. Claims 6 and 9 have been amended to recite "the" polyester-based resin composition, in light of recitation of the polyester-based resin composition in claim 1. Claim 11 has been amended to delete its dependency on claim 9, leaving only its dependency on any one of claims 1-5, to recite "a" packaging container in light of deletion of dependency on claim 9, and to recite "the" polyester-based resin composition in light of antecedent recitation of such resin composition in each of parent claims 1-5.

Moreover, Applicants are adding new claims 12 -18 to the application. Claims 12 and 13, each dependent on claim 1, each further defines the phosphorus compound; and claim 14, dependent on claim 1, defines a minimum concentration of phosphorus compound, in terms of phosphorus atoms, contained in the polyamide resin (A). Claims 15 and 16, each dependent on claim 1, each further defines a maximum concentration of the phosphorus compound contained in the polyamide resin (A); and claims 17 and 18, each dependent on claim 1, each further defines the upper limit in the formula (1).

In connection with present amendments to the claims, as well as the newly added claims, note, for example, pages 9-11, as well as the Examples starting on page 17 and shown in Table 1 on pages 21 and 22, of Applicants' specification.

The rejection of claims 1-11 under the second paragraph of 35 USC §112, as set forth in Item 1 on page 2 of the Office Action mailed August 5, 2003, is noted. Basis for this rejection is that it is unclear as to whether or not the presence of the phosphorus compound is required. Applicants have amended claim 1, the sole independent claim in the application, to positively recite that the polyamide resin (A) contains phosphorus compound, also reciting a maximum concentration of the phosphorus compound in the polyamide resin (A) in terms of phosphorus atom. In light of amendments to claim 1, it is respectfully submitted that all of the claims are clear in that the polyamide resin (A) contains phosphorus compound, such that basis for the rejection under the second paragraph of 35 USC §112 is now moot.

Applicants respectfully submit that all of the claims presented for consideration by the Examiner patentably distinguish over the teachings of the references applied by the Examiner in the Office Action mailed August 5, 2003, that is, the teachings of the U.S. Patents to Turner, et al., No. 6,444,283, and to Jones, et al., No. 6,103,857, and European Patent Application No. 301 719, under the provisions of 35 USC §102 and §103.

It is respectfully submitted that these references as applied by the Examiner would have neither taught nor would have suggested such a polyester-based resin composition as in the present claims, containing a melt blend (C) of the polyamide resin (A) and the polyester resin (B), and wherein the polyamide resin (A) contains a

phosphorus compound, with a concentration of the phosphorus compound in the polyamide resin (A), in terms of phosphorus atom, being 200 ppm or less, and with the polyester-based resin composition satisfying the formulas (1) and (2) as set forth in claim 1. Note claim 1.

It is also respectfully submitted that the teachings of the applied references would have neither disclosed nor would have suggested the other aspects of the present invention as in the remaining, dependent claims, including (but not limited to) the specific phosphorus compounds included in the resin composition as set forth in claims 3, 12 and 13; and/or minimum concentration of phosphorus compound in the polyamide (A) as in claim 14, and maximum concentrations as in claims 15 and 16; and/or further-defined maximum values for the formula (1) as in claims 17 and 18; and/or further definitions of the polyamide resin (A) and polyester resin (B) as in claims 2, 4 and 5; and/or the shaped article or packaging container formed using this resin composition as in claims 6-11.

The present invention is directed to a resin composition containing a polyamide resin and a polyester resin, a shaped article, and a packaging container made of the resin composition.

A polyester resin such as poly(ethylene terephthalate) has been widely used as a packaging material because of excellent clarity, mechanical properties, melt stability, solvent resistance, flavor retention, recycling ability, etc. However, the polyester resin is not always sufficient in gas barrier properties, for example, against oxygen, carbon dioxide, etc.

As a technique for improving the gas barrier properties of polyester resins, melt blending of polyamide resins having high gas barrier properties with a polyester resin has been proposed. For example, poly(m-xylylene diadipamide) has been found suitable for improving gas barrier properties of polyester resin. A commercially available poly(m-xylylene diadipamide) contains a phosphorus compound in an amount of several hundred ppm in terms of phosphorus atom, to prevent the coloring of the resin during melt processing.

Moreover, production of polyester resin has generally been carried out in the presence of a metal catalyst containing germanium atom or antimony atom to increase polymerization rate. However, when using an antimony compound as a catalyst, the article formed using the produced polyester resin is slightly darkened because of deposition of metallic antimony by reduction of the antimony compound. This darkening is particularly a problem where the resin is used as a packaging material or container for foodstuffs.

Against this background, and as a result of extensive study for solving, inter alia, the aforementioned darkening problem, the present inventors have found that the increase in the darkening of a resin composition that contains a polyester resin prepared using an antimony compound as a catalyst and a polyamide resin, can be prevented by regulating a relationship between the concentration of phosphorus atom derived from a phosphorus compound in the polyamide resin and a blending amount of the polyamide resin, achieving a polyester-based resin composition with improved gas barrier properties and which avoids undesirable darkening of the shaped articles formed using the composition. Specifically, Applicants have found that by incorporating

the phosphorus compound in the polyamide resin (A) in a concentration of 200 ppm or less, in terms of phosphorus atom, and wherein components of the resin composition satisfy the formulas (1) and (2) in claim 1, a polyester-based resin composition with improved gas barrier properties, yet which avoids undesired darkening, can be achieved. In particular, the present inventors have found that the darkening can be effectively prevented by regulating the relationship between the phosphorus concentration and the blending amount of the polyamide resin within the range represented by the formula (1).

Turner, et al. discloses a polymer blend comprising about 80-99.5 weight % of a semi-crystalline polyester including specific residues; and from about 20 to greater than about 2 weight % of a low molecular weight polyamide having a number average molecular weight of less than about 15, 000 and having the repeating unit A-D, A and D being defined residues. Note, column 2, lines 30-52. See also column 5, lines 24-26 and 33-36. Note also column 7, lines 9-18, describing additives that may be used in the polyester/polyamide blend composition if desired. See also column 7, lines 34-37.

It is respectfully submitted that Turner, et al. does not disclose, nor would have suggested a polyester-based resin composition as in the present claims, including wherein the polyamide resin (A) contains a phosphorus compound, much less the maximum concentration of the phosphorus compound in the polyamide resin (A), in terms of phosphorus atom, as in the present claims, and advantages thereof as discussed in the foregoing.

It is respectfully submitted that the secondary references as applied by the Examiner would not have rectified the deficiencies of Turner, et al., such that the

presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

Jones, et al. discloses a poly(ethylene terephthalate) copolymer composition containing both 1,4,-cyclohexanedimethanol and isophthalic acid (or dimethyl isophthalate) as modifying monomers. See column 1, lines 13-16 and 48-50. Note also column 1, lines 60-64 and column 2, lines 6-13 and 52-57. Note also column 3, lines 16-22, describing that, generally, at the end of the esterification in forming the polyester, a polycondensation catalyst is added, suitable polycondensation catalysts including salts of titanium, gallium, germanium, tin, antimony and lead, preferably antimony or germanium or a mixture thereof.

Even taking the teachings of Jones, et al., with the teachings of Turner, et al, such combined teachings would have neither disclosed nor would have suggested the presently claimed subject matter, including wherein the polyamide resin (A) of the polyester based resin composition contains a phosphorus compound, much less wherein the phosphorus compound is contained in a range up to a maximum concentration, and advantages of the present invention as discussed in the foregoing; or the other aspects of the present invention as discussed previously.

The contention by the Examiner in the third paragraph on page 3 of the Office Action mailed August 5, 2003, that the rejection pertains to the embodiment of the present claims wherein the polyamide does not contain any phosphorus compound, i.e., when P equals zero, is noted. However, as presently amended, the claims recite that the polyamide resin (A) contains a phosphorus compound; clearly, the rejection of claims, as applied by the Examiner in the Office Action mailed August 5, 2003, is not

applicable to the presently amended claims, even as the references have been applied by the Examiner.

It is respectfully submitted that the additional teachings of No. 301 719 would not have rectified the deficiencies of the combined teachings of Turner, et al. and Jones, et al., such that the presently claimed invention as a whole would have been obvious to one of ordinary skill in the art.

No. 301 719 discloses packaging, particularly packaging for oxygen-sensitive materials, especially foods and beverages. The patent document discloses a wall for a package, which includes a layer comprising a composition including a polymer and having oxygen-scavenging properties, the composition scavenging oxygen through metal-catalyzed oxidation of an oxidizable organic component thereof. See page 4, lines 4-7. Note also page 4, lines 49 and 50. See, further, page 6, lines 35-38 and page 7, lines 31-40. This patent discloses that particularly interesting oxidizable polymers are the polyamides, and that these polyamides are of special interest with cobalt and rhodium catalysts.

Even assuming, arguendo, that the teachings of No. 301 719 were properly combinable with the teachings of Turner, et al. and Jones, et al., these combined teachings would have neither disclosed nor would have suggested such polyester-based resin composition as in the present claims, wherein the polyamide resin (A) contains a phosphorus compound, much less where such polyamide resin (A) contains a phosphorus compound in a range up to the maximum concentration as in the present claims, and/or wherein the resin composition satisfies the formulas (1) and (2) in claim 1, and advantages achieved by the present invention.

As for the present advantages, attention is respectfully directed to Examples 1-9 and Comparative Examples 1-6, described on pages 17-21 of Applicants' specification and shown respectively in Tables 1 and 2 on pages 21-23 of Applicants' specification. As seen therein, by the present invention oxygen gas barrier properties were improved as compared with structure formed solely of polyester, while avoiding deterioration of appearance. Note also Example 10 and Comparative Examples 7 and 8 on pages 24 and 25 of Applicants' specification, data in connection therewith being shown in Table 3 on page 25 of Applicants' specification. As can be seen therein, where the balance between the polyamide resin content and phosphorus concentration falls within the scope of the present claims, gas barrier properties are improved as compared with structure made only of the polyester; and, in addition, structure within the scope of the present invention was substantially free from darkening due to deposition of antimony metal, and presented a clear appearance. Note especially the discussion of results of the examples and comparative examples, in the paragraph bridging pages 23 and 24 and the first full paragraph on page 24, and in the paragraph bridging pages 25 and 26 and in the first full paragraph on page 26, of Applicants' specification.

As can be seen in the Examples and Comparative Examples in Applicants' original specification, the composition according to the present invention provides superior unexpected results in avoiding undesired darkening while having excellent gas barrier properties.

In view of the foregoing comments and amendments, reconsideration and allowance of all claims presently in the application are respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Deposit Account No. 01-2135 (Case No. 396.41186X00), and please credit any excess fees to such Deposit Account.

Respectfully submitted,

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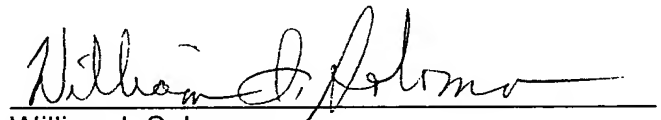

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